

MEXICO: CHIHUAHUA: 3 ♀♀; Samalayuca; June 24, 1947
(Crazier, Michener and Bradt) (AMNH).

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**NEW SPECIES AND RECORDS OF MALLOPHAGA FROM
GALLINACEOUS BIRDS OF THAILAND¹**

K. C. EMERSON, *Stillwater, Oklahoma*

and

ROBERT E. ELBEL, *Department of Zoology,*

University of Oklahoma, Norman, Oklahoma

The Mallophaga described and identified in the following notes, except for one small series in the British Museum (NH), were collected in Thailand by R. E. Elbel, H. G. Diegnan, and Boonsong Lekagul during the period April 1953 to April 1955. Host identifications were

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furnished by Mr. Deignan, and are in accordance with the classification to be discussed in his forthcoming "Check-list of the Birds of Thailand." Skins of the birds from which the lice were collected are now in the U. S. National Museum. Collections were made possible by assistance from the U. S. National Museum and the United States Operations Mission to Thailand. The holotype and allotype of the new species described herein have been deposited in the U. S. National Museum. Dr. Theresa Clay, British Museum (NH), loaned considerable material for comparison, and offered many helpful suggestions. The authors gratefully acknowledge the assistance given by Dr. Clay, Dr. Phyllis T. Johnson, and Mr. Deignan during the preparation of this report.

AMBLYCERA

Amyrsidea monostoecha (Kellogg).

Menopon monostoechum Kellogg, 1896. Proc. Calif. Acad. Sci. (2), 6: 530, pl. 72, fig. 4. Type host: *Phasianus nycthemerus*=*Lophura nycthemera nycthemera* (Linnaeus).

Specimens collected.—4 males and 4 females at Ban Na Muang, Na Haeo, Dan Sai, Loei; off *Lophura nycthemera jonesi* (Oates). The species was described from specimens taken off a Silver Pheasant in San Francisco, Calif. The specimens taken agree with Kellogg's descriptions and illustrations, but have not been compared with the types or with material from type host.

Amyrsidea phaeostoma (Nitzsch).

Menopon phaeostomum Nitzsch, 1866. Z. ges. Nat. Wiss. 28: 391. Type host: *Pavo cristatus* (Linnaeus).

Specimens collected.—4 males and 3 females on Phu Kho Mountain, Kan Luang, Na Kae, Nakhon Phanom; off *Pavo muticus imperator* Delacour. Two species of *Amyrsidea* are found on *Pavo cristatus*, this being the larger of the two forms. The specimens collected appear to be conspecific with material from the type host. They agree with specimens which Dr. Clay has compared with the figures in the Nitzsch Manuscript presently in the British Museum (NH). The smaller species of *Amyrsidea*, which is more common on domestic pea fowls, was not collected. The male genitalia are illustrated in figure 15.

Amyrsidea uniseriata (Piaget).

Menopon uniseriatum Piaget, 1880. Les Pediculines: 464, pl. 37, fig. 4. Type host: *Phasianus praetatus*=*Lophura diardi* (Bonaparte).

Specimens collected.—29 males and 15 females on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; 1 male and 2 females at Ban Sang Kho, Khok Phu, Sakon Nakhon; 3 males and 2 females on Phu Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; 4 males and 2 females on Khao Sawan Mountain, Sieo, Loei; and 1 male and 4 females at Ban Muang Khai, Tha Li, Loei; off *Lophura diardi* (Bonaparte). This species apparently has not been reported since the original de-

scription. Specimens have been compared with the Piaget types in the British Museum (NH), and they appear to be conspecific. The male genitalia are illustrated in figure 14.

Colpocephalum echinatum Ewing.

Colpocephalum echinatum Ewing, 1930. Proc. Ent. Soc. Wash., 32: 118. Type host: *Paro muticus muticus* Linnaeus.

Specimens collected.—8 males and 8 females on Phu Kho Mountain, Kam Luang, Na Kae, Nakhon Phanom; off *Paro muticus imperator* Delacour. Specimens have been compared by Dr. Johnson with Ewing's types in the U. S. National Museum, and they appear to be conspecific.

Menopon gallinae (Linnaeus).

Pediculus gallinae Linnaeus, 1758. Syst. Nat., ed. 10: 613. Type host: *Phasianus gallus* ("domesticus")=*Gallus gallus* "domesticus."

Specimens collected.—6 males and 3 females at Ban Sang Kho, Khok Phu, Sakon Nakhon; 2 males and 2 females on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; 2 males and 3 females at Ban Muang Khai, Tha Li, Loei; and 11 males and 12 females on Khao Sawan Mountain, Siao, Loei; off *Lophura diardi* (Bonaparte). This species is rather common on both domestic and wild chickens. We are unable to distinguish between the specimens taken off *Lophura diardi* and those collected off chickens.

ISOCHNOCERA

Cuclotogaster phayrei n. sp.

Male.—General shape and chaetotaxy as shown in figure 5. Abdominal tergites on segments II and III, divided medianly. Accessory dorsal plates, not divided medianly, on abdominal segments III-VI. Genitalia as shown in figure 16.

Female.—Similar to the male in general shape, but slightly larger; being 1.68 mm in total length. Antennae filiform. Abdominal tergites divided medianly in segments II-VII. Posterior margin of vulva bilobed; with 16 to 18 short setae evenly spaced on the margin, and 16 to 18 minute setae scattered on the surface.

This species is closely related to *Cuclotogaster gedgii* (Clay), 1938, found on *Francolinus clappertoni gedgii* Ogilvie-Grant. The male of *C. gedgii* has accessory dorsal plates on abdominal segments II-VII, and they are divided medianly on segments II, III, VI, and VII. The male of *C. phayrei* has accessory dorsal plates on abdominal segments III-VI, none of which are divided. The male genitalia of the two forms differ greatly. The female of *C. phayrei* possesses more setae on the margin of the vulva than does *C. gedgii*. The undivided tergite on abdominal segment VIII is also distinctive.

Type host.—*Francolinus pintadeanus phayrei* (Blyth).

Type material.—Holotype male, allotype female, 2 paratype males and 1 paratype female were collected at Ban Hua Thanon, Khlong Khlung, Kamphaeng Phet.

Cuclotogaster subinsolitus n. sp.

Male.—General shape and chaetotaxy as shown in figure 6. Posterior pterothoracic setae arranged: 1, 2, 2, 1, 1, 2, 2, 1. Abdominal tergite on segment II is divided medianly, the remainder being transversely continuous. Accessory dorsal plates, on abdominal segments IV-VII; none of which are divided medianly. Genitalia as shown in figure 17.

Female.—Similar to the male in general shape, but larger; being 2.02 mm in total length. Antennae filiform. Dorsal posterior pterothoracic setae arranged: 1, 2, 2, 2, 2, 1. Abdominal tergites on segments II-VII, divided medianly. Except for terminal segments, abdominal chaetotaxy same as in the male. Chaetotaxy and structure of genital region same as that given by Clay (1938) for *C. insolitus*.

This species is closely related to *Cuclotogaster insolitus* (Clay), 1938, found on *Arborophila rufogularis tickelli* (Hume). The form is distinguished from *C. insolitus* by the more rounded anterior margin of the head and by being considerably larger. In the male of *C. insolitus*, the tergal plates on abdominal segments II-VI are divided medianly; in *C. subinsolitus*, only the tergal plate on abdominal segment II is divided medianly. The male genitalia of the two forms appear to be very similar. The female of *C. subinsolitus* does not have the tergal plate on abdominal segment VIII divided medianly.

Type host.—*Arborophila brunneopectus brunneopectus* (Blyth).

Type material.—Holotype male, allotype female, 9 paratype males, and 10 paratype females collected on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei.

Goniocotes parviceps (Piaget).

Goniodes parviceps Piaget, 1880. Les Pediculines: 277, pl. 23, fig. 2. Type host: *Pavo cristatus* Linnaeus.

Specimens collected.—8 males and 6 females on Phu Kho Mountain, Kan Luang, Na Kae, Nakhon Phanom; off *Pavo muticus imperator* Delacour. *Goniocotes parviceps* (Piaget) and *Goniocotes rectangulatus* Nitzsch are two closely related forms found on *Pavo cristatus*. Both are atypical, and are occasionally included in the genus *Goniodes*. The females possess characters typical of those found in other species of *Goniocotes*. The sexual dimorphism exhibited in the head of the male and the male genitalia indicate an affinity to the genus *Goniodes*; these are illustrated in figures 9, 10, and 11. We believe that both species should be retained in *Goniocotes* until a more complete study can be made of the genus. *Goniocotes yugarejsuf* Eiehler, 1950, was described and illustrated from female specimens taken off *Pavo cristatus*. The descriptions and illustrations agree completely with females of *Goniocotes parviceps* taken from that host. Specimens collected off *Pavo muticus imperator* have been compared with material from the type host and they appear to be conspecific. The male genitalia are complex and there are minor differences, but these appear to be no greater than the differences between individuals collected off the same host.

Goniodes cervinicornis Giebel

Goniodes cervinicornis Giebel, 1874. Insecta Epizoa: 199. Type host: *Phasianus nycthemera*=*Lophura nycthemera nycthemera* (Linnaeus).

Specimens collected.—1 male at Ban Na Muang, Na Haeo, Dan Sai, Loei; 1 female on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; and 10 males and 19 females on Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; off *Lophura nycthemera jonesi* (Oates). Clay redescribed and illustrated this species from material taken off museum skins of the type host. These specimens agree with Clay's descriptions and illustrations.

Goniodes chloropus n. sp.

Male.—General shape and chaetotaxy as shown in figure 7. Temples not expanded beyond width of preantennal region of forehead. Membraneous portion of clavi well developed. First antennal segment enlarged and bearing a thickened process. Lateral margins of prothorax each with three short setae. Genitalia as shown in figure 12.

Female.—General shape and chaetotaxy as shown in figure 8. Temples expanded to a width greater than that of the preantennal region of forehead. Clavi only slightly developed. Antennae filiform. Ventrally, a row of short stout setae in the lateral lobes of the terminal abdominal segment.

While this species belongs to Clay's (1940) "species group I," it does not particularly resemble any of the known species. The wide marginal carina of the forehead, the male genitalia, and the structure and chaetotaxy of the female genital region distinguish it from all known species of the genus.

Type host.—*Arborophila charltouii chloropus* (Blyth).

Type material.—Holotype male, allotype female, 3 paratype males, and 2 paratype females collected at Ban Hua Thanon, Khlong Khlung, Kamphaeng Phet.

Goniodes coronatus (Giebel).

Goniocotes coronatus Giebel, 1874. Insecta Epizoa: 302. Type host: *Crypturus coronatus*=*Rollulus rontroul* (Scopoli).

Specimens collected.—12 males and 5 females on Khao Phap Pha Mountain, Ban Na, Phattalung; off the type host. These specimens agree with Clay's (1940) descriptions and illustrations.

Goniodes diardi Clay.

Goniodes diardi Clay, 1940. Proc. Zool. Soc. Lond. (B), 110: 70, figs. 2a and 48c. Type host: *Lophura diardi* (Bonaparte).

Specimens collected.—1 male and 1 female at Ban Na Muang, Na Haeo, Dan Sai, Loei; 4 males and 2 females on Phu Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; 1 male and 3 females at Ban Sang Kho, Khok Phu, Sakon Nakhon; 2 males and 5 females on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; and 1 male and 2 females at Ban Muang Khai, Tha Li, Loei; off *Lophura diardi* (Bonaparte). All specimens agree with Clay's descriptions and illustrations.

Goniodes pavonis (Linnaeus).

Pediculus pavonis Linnaeus, 1758. Syst. Nat., ed. 10: 613. Type host: *Paro cristatus* Linnaeus.

Specimens collected.—7 males and 9 females on Phu Kho Mountain, Kan Luang, Na Kae, Nakhon Phanom off *Paro muticus imperator* Delacour. These specimens agree with Clay's (1940) descriptions and illustrations.

Goniodes processus Kellogg and Paine.

Goniodes processus Kellogg and Paine, 1914. Rec. Indian Mus., 10: 226, pl. 15, fig. 9. Type host: *Arborophila rufogularis rufogularis* (Blyth).

Specimens collected.—7 males and 6 females on Phu Lom Lo Mountain, Kok Sathon, Dau Sai, Loei; off *Arborophila brunneopictus brunneopictus* (Blyth). Clay (1940) redescribed and illustrated this species from specimens taken off museum skins of *Arborophila rufogularis tickelli* (Hume), and reported collections from skins of five other species and subspecies of *Arborophila*. She also noted (p. 25): "Specimens from skins of *A. b. brunneopictus* (Blyth), *A. b. henrici* (Oustalet), and *A. erythrophrys* (Sharpe) from Borneo do not appear quite typical, and may prove to be a new subspecies." The specimens collected agree with the illustrations and descriptions given by Clay, but have not been compared with specimens from the type host.

Lipeurus boonsongi n. sp.

Male.—General shape and chaetotaxy as shown in figure 4. Postantennal constriction not pronounced, breadth at temples almost equal to that of the praentennal region. Four dorsal setae on prothorax. Two short and three long setae in each posterior lateral angle of pterothorax. Abdominal tergal plates narrow and transversely continuous. Eight medium-length setae on margin of genital opening. Genitalia as shown in figure 18.

Female.—Slightly larger than male; total length being 2.13 mm. Head without postantennal constriction, temples slightly expanded. Antennae filiform. Prothorax with two dorsal setae. Pterothorax as in the male. Abdominal tergal plates wide and transversely continuous. Eight medium-length and twelve short setae on margin of genital opening.

This species is closest to *Lipeurus fimbriatus* Clay, 1938, found on *Melanoperdix nigra nigra* (Vigors). It can be separated from that species by the shape of the head, male genitalia, and the chaetotaxy of the terminal abdominal segments.

Type host.—*Fraucolinus pintadeanus phayrei* (Blyth).

Type material.—Holotype male, allotype female, 2 paratype males and 2 paratype females collected at Ban Hua Thanon, Khlong Khlung, Kamphaeng Phet. Three male paratypes and six female paratypes collected in Burma are in the British Museum (NH).

Lipeurus deignani n. sp.

Male.—General shape and chaetotaxy as shown in figure 3. Marked postantennal constriction, breadth at temples almost equal to that of praentennal region.

First antennal segment enlarged and bearing a short blunt appendage. Four dorsal setae on prothorax. Two short and five long setae in each posterior lateral angle of pterothorax. Wide abdominal tergal plates. Chaetotaxy of genital region as in *Lipeurus brunneipictus* (Giebel). Male genitalia as shown in figure 19.

Female.—Similar to *L. brunneipictus*, except for the chaetotaxy on the margin of the vulva. This form has twenty-eight long and medium-length setae on the margin of the vulva, as compared with twenty setae of the same sizes on the vulva of *L. brunneipictus*. Total length is 2.96 mm.

This species is closest to *Lipeurus brunneipictus* (Giebel), 1877, found on *Lophura ignita rufa* (Raffles). It can be separated from that species by the shape of the first antennal segment of the male, the wide abdominal tergal plates of the male, the male genitalia, and the chaetotaxy of the genital region of the female.

Type host.—*Lophura diardi* (Bonaparte).

Type material.—Holotype male, allotype female, 3 paratype males, and 5 paratype females collected at Khao Sawan Mountain, Sico, Loei. Other paratypes are: 25 males and 26 females collected on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; 7 males and 4 females collected at Siracha, Chon Buri; 6 males and 7 females collected at Ban Sang Kho, Khok Phu, Sakon Nakhon; 11 males and 16 females collected on Phu Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; 2 males and 1 female collected at Ban Na Muang, Na Hao, Dan Sai, Loei; and 1 male and 1 female collected at Ban Muang Khai, Tha Li, Loei.

Lipeurus introductus Kellogg

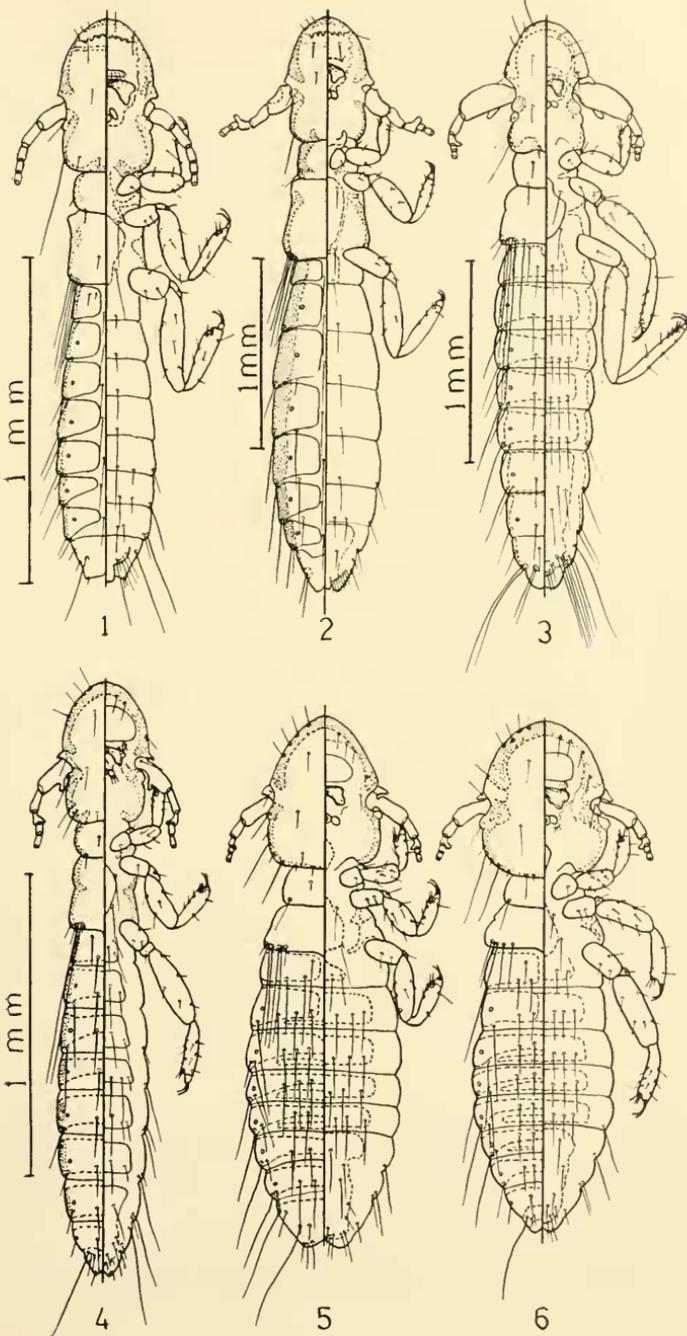
Lipeurus introductus Kellogg, 1896. Proc. Calif. Acad. Sci. (2), 6: 500, pl. 68, figs. 1 and 5. Type host: *Phasiannus nythemera* = *Lophura nythemera nythemera* (Linnaeus).

Specimens collected.—1 male and 3 females at Ban Na Muang, Na Hao, Dan Sai, Loei; 1 female on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; and 9 males and 18 females on Phu Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; off *Lophura nythemera jonesi* (Oates). The species was described from specimens taken off a Silver Pheasant in San Francisco, California. Clay (1938) redescribed and illustrated the form as *Lipeurus subscellatus* Harrison, 1916, a synonym, from specimens taken off museum skins of the type host. The specimens collected agree with Clay's descriptions and illustrations.

Oxylipeurus annamensis n. sp.

Male.—General shape and chaetotaxy as shown in figure 2. Posterior margin of the modified chitin of the forehead with six prominent serrations. First antennal segment enlarged and elongated, with a circular-shaped clear area. Abdominal tergites, except for terminal segment, divided medianly. Posterior sternal plate

Fig. 1. *Oxylipeurus formosanus* (Uchida), dorsal-ventral view of male; fig. 2. *Oxylipeurus annamensis* n. sp., dorsal-ventral view of male; fig. 3. *Lipeurus deigmani* n. sp., dorsal-ventral view of male; fig. 4. *Lipeurus boonsongi* n. sp., dorsal-ventral view of male; fig. 5. *Cuelotogaster phayrei* n. sp., dorsal-ventral view of male; fig. 6. *Cuelotogaster subinsolitus* n. sp., dorsal-ventral view of male.



prolonged into a short, thickened modified process. On each side of this process, a row of eight setae. Genitalia as shown in figure 13.

Female.—Slightly larger than the male, being 3.42 mm in total length. Forehead as in the male. Antennae filiform. Chaetotaxy of thorax and abdomen similar to the male, except for terminal segment. Terminal abdominal segment deeply bieleft. Margin of vulva bieleft, with a row of 24 to 26 setae.

This species is closely related to *Orylipeurus piagetinus* Hopkins, 1950, found on *Lophura ignita ignita* (Shaw). In *O. piagetinus*, the posterior margin of the modified chitin of the forehead is straight; whereas in *O. annamensis*, this margin is prominently serrated.

Type host.—*Lophura diardi* (Bonaparte).

Type material.—Holotype male, allotype female, 4 paratype males and 4 paratype females were collected at Ban Sang Kho, Khok Phu, Sakon Nakhon. Other paratypes are: 8 males and 10 females collected on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; 5 males and 1 female collected on Phu Phak Khi Nak Mountain, Kok Sathon, Dan Sai, Loei; 9 males and 10 females collected on Khao Sawan Mountain, Sico, Loei; 1 female collected at Ban Na Muang, Na Haeo, Dan Sai, Loei; and 7 males and 3 females collected at Ban Muang Khai, Tha Li, Loei.

Oxylipeurus formosanus (Uchida).

Lipeurus formosanus Uchida, 1917. J. Coll. Agric. Tokyo, 3: 179, fig. 1. Type host: *Arborophila cradigularis* (Swinhoe).

Specimens collected.—29 males and 15 females on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; off *Arborophila brunneopectus brunneopectus* (Blyth). These specimens have been compared with material from the type host collected in Formosa. We are unable to find any significant differences between the two populations. The male is illustrated in figure 1. The male genitalia are of the same type as found in *Orylipeurus annamensis*.

Oxylipeurus megalops (Piaget).

Lipeurus megalops Piaget, 1880. Les Pedicellines: 675, pl. 16, fig. 8. Type host: *Cryptonyx coronatus*=*Rollulus roulroul* (Scopoli).

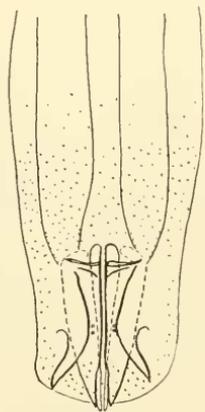
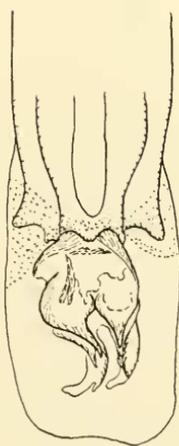
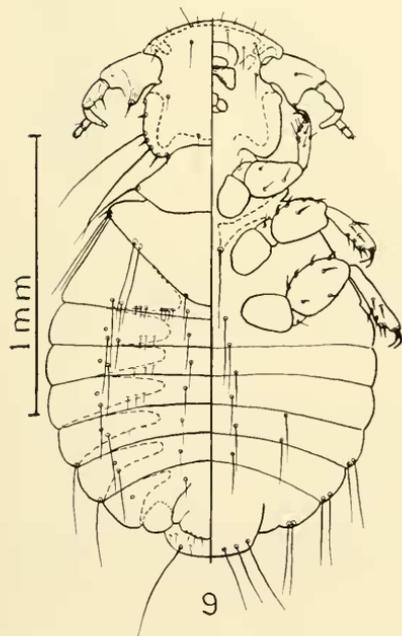
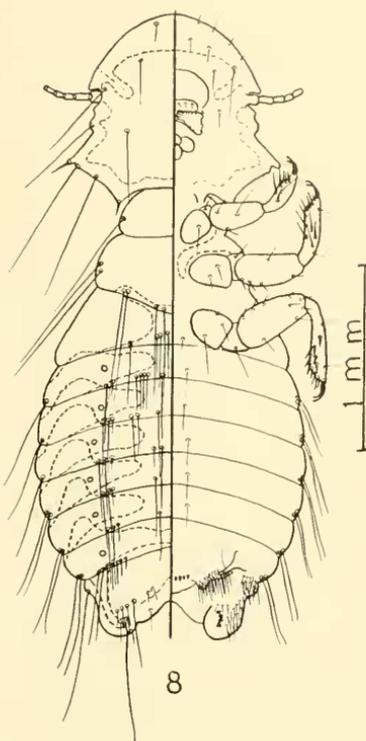
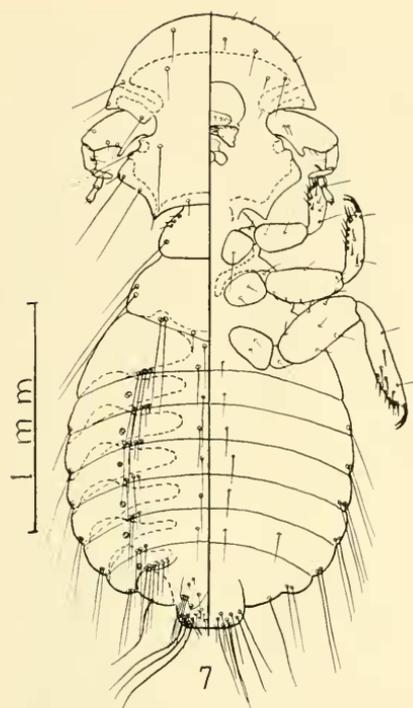
Specimens collected.—7 males and 11 females on Khao Phap Pha Mountain, Ban Na, Phattalung; off the type host. These specimens agree with Clay's (1938) descriptions and illustrations.

Oxylipeurus unicolor (Piaget).

Lipeurus unicolor Piaget, 1880. Les Pedicellines: 354, pl. 28, fig. 6. Type host: *Arborophila brunneopectus javanica* (Gmelin).

Specimens collected.—11 males and 10 females on Phu Lom Lo Mountain, Kok Sathon, Dan Sai, Loei; off *Arborophila brunneopectus brunneopectus* (Blyth). Clay (1938) redescribed and illustrated the species from material taken off museum skins of the type host, and re-

Fig. 7. *Goniodes chloropus* n. sp., dorsal-ventral view of male; fig. 8. *Goniodes chloropus* n. sp., dorsal-ventral view of female; fig. 9. *Goniocotes parviceps* (Piaget), dorsal-ventral view of male; fig. 10. *Goniocotes parviceps* (Piaget), male genitalia; fig. 11. *Goniocotes rectangularis* Nitzsch, male genitalia.



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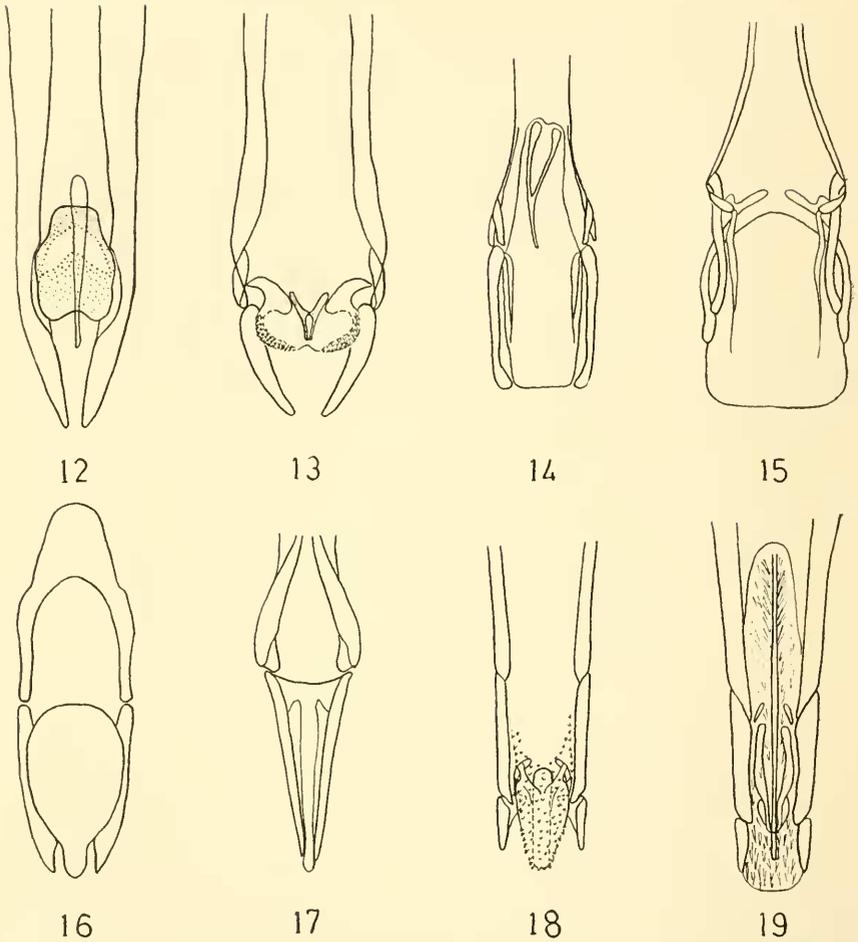


Fig. 12. *Goniodes chloropus* n. sp., male genitalia; fig. 13. *Oxylipeurus annamensis* n. sp., male genitalia; fig. 14. *Amyrsidea uniseriata* (Piaget), male genitalia; fig. 15. *Amyrsidea phacostoma* (Nitzsch), male genitalia; fig. 16. *Cuclotogaster phayrei* n. sp., male genitalia; fig. 17. *Cuclotogaster subiusolitus* n. sp., male genitalia; fig. 18. *Lipeurus boonsongi* n. sp., male genitalia; fig. 19. *Lipeurus deiguanii* n. sp., male genitalia.

ported collections from skins of 15 other species and subspecies of *Arborophila*. The specimens collected agree with Clay's descriptions and illustrations.

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BLACK FLIES ATTRACTED TO MEAT BAIT¹

(DIPTERA: SIMULIIDAE)

Bait traps with ground beef as the attractant, set during the summer months of 1954-55 at O'Sullivan Dam, Grant County, Wash., yielded considerable numbers of black flies, *Simulium vittatum* Zett. A preliminary investigation of the literature and personal correspondence with Dr. Alan Stone and Dr. Herbert Dalmat have failed to show any records of black flies having been attracted to meat bait traps.

The traps were placed in the field at six stations, each representing a somewhat different ecological habitat; some were located in dry sage and sand types of environment, whereas others were established along the grassy margins of seepage ponds. The traps were placed in the field at approximately 7 a.m. and allowed to remain until 7 p.m.

The bait traps were of the old-fashioned fly trap variety, that is, a common cylindrical screen with an inverted cone, a white cloth used as a tie at the top, and the entire trap supported by an unpainted plywood frame.

The bait was ground beef with ample quantities of tallow, placed on a piece of white paper towel (which also helps to attract insects) and anchored to the ground with small sticks or nails. The advantage of using ground beef in this area is its moisture-retaining qualities. Freshness of the bait also appeared to be an important factor. Un-

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